1872MNRAS..32..158.

with every accuracy the method of computation indicated by the Astronomer Royal, with certain modifications to suit this particular case. An ephemeris of Tuttle's comet, of short period, for the Southern hemisphere, was issued from this observatory, by the aid of which Mr. Stone had been able to observe it at the Cape of Good Hope in the middle of December. The periodical comet of De Vico, which has not been detected since its appearance in 1844, has been sought for on the assumption that a perihelion passage might take place in the autumn of 1871. It now appears probable that this did not occur between August and November.

Royal Observatory, Cape of Good Hope.

The chief attention of the staff has been directed to the reduction and passing through the press of the observations made with the Transit-Circle, in order to bring forward a catalogue of stars from observations made since the erection of that instrument. The Transit-Circle was brought systematically into use in 1856. The observations made in that year have been reduced, printed, and distributed. The observations made in 1857 have been printed, Those in 1858 have been partially printed. The reductions of the observations made in 1859 are in a forward state. The meteorological observations from 1841 to 1870 have been collected, discussed, and the results printed and distributed. The miscellaneous magnetical observations, not hitherto printed, have been collected, reduced when necessary, the means taken, and the results prepared for press. It is intended to append these miscellaneous observations to the volume containing the results for 1857 and 1858, which it is hoped may soon be ready for distribution.

The work of the Observatory has been much impeded since August by the illness, at one time, of no less than three of the staff, and the lamented death, on September 18, of Mr. Sinfield, an assistant of considerable experience and much promise. Much time has been devoted to the examination of the form of the pivots and the division-errors of the Transit-Circle. The observing with the Transit-Circle has been chiefly directed to observations of the zenith distance of circumpolar stars, wide and close, both above and below pole, to afford material for a separation of any existing errors in the refractions adopted, and the co-latitude of the observatory. Observations of *α Centauri*, *β Centauri*, and *α Eridani*, have been made to test the truth of the reference of a large systematic annual change in the zenith distances of *α Centauri*, observed at this observatory, to annual parallax.

A complete reobservation of all stars down to the seventh magnitude within 5° of the South Pole has also been made. Each star has been observed at least three times.

The Equatoreal has been employed upon observations of Winnecke's Comet I. 1871, Tuttle's comet, and a reobservation of many of Herschel's double stars. A few attempts have been

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1872MNRAS..32..159.

made to use the spectroscope with it, but without much success. The mounting is too weak and the driving-clock too defective for any employment of the Equatoreal upon such work with advantage. The aperture of the object-glass, seven inches, is small for such work upon faint objects.

The November meteors were carefully looked for, but very few were seen.

It is intended this year to observe the principal stars within the ecliptic limits for absolute right ascension—a point which has not previously received attention here. The changes of temperature between day and night are very considerable, and it has been thought necessary to protect the chief sidereal clock as far as possible against exposure to these changes. A change has, for this purpose, been prepared in the interior of the building where the changes of temperature from day to night are confined within a degree. The clock will stand upon a pier raised free from the walls and floors directly from the rocks below the building.

It is intended to repeat during the winter season the observation of the stars within 5° of the South Pole. Such observations are thought likely to be of value both for the determination of azimuthal errors in the Southern hemisphere, and also at some future period for an accurate determination of the constants connected with the motion of the polar axis by reference of its position to the mean of the group of stars rather than to one or two selected stars.

Sydney Observatory.

Mr. Russell, who succeeded Mr. Smalley in the charge of this Observatory, read a report on the state and progress of the Observatory during the year 1870, at the Annual Visitation held on September 7, 1871. A few extracts from the Report are here given :—

"From the commencement of the year up to the time of his lamented death on the 12th of July, 1870, the late Astronomer had charge of the base-line operations at Lake George, in addition to the Observatory, and during that time all that his failing health allowed him to do was devoted to the base-line. Greater part of the Computer's time was also given to the examination of the instruments, measuring-bars, and other things connected with the same work. Little, therefore, could be done in the Observatory except the regular observations with the transit-instrument, the meteorological work and its regular reduction and publication, together with the examination and preparation of thirty sets of meteorological instruments for the new stations.

" The transit-instrument was in constant use, but not in good order ; the dust, which got to the bearings in spite of close-fitting caps, cut into the soft pivots, and then they were made rough into the agate planes and removed the polish, so that the wear was

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